UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/808,939	03/16/2001	Akio Okazaki	P 278090 T4A0-00S1176-1	5287

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STREGE, JOHN B

ART UNIT	PAPER NUMBER
2625	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.		**Applicant(s)**
Office Action Summary	09/808,939		OKAZAKI ET AL.
	Examiner		**Art Unit**
	John B Strege		2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 March 2001*.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,13,16-26 and 28* is/are rejected.

7)☒ Claim(s) *12,14,15,27,29 and 30* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 March 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☒ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date *2*.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____ .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

2.   Claims 1, 9-10, 16, and 24-25 are rejected under 35 U.S.C. 102(b) as being

anticipated by Tal USPN 4,975,969.

Claim 1 discloses, "an image processing apparatus characterized by comprising:

image processing means for sensing object images from different directions, extracting

feature points from the sensed object images, and computing a feature pattern on the

basis of the extracted feature points."

Tal discloses a method and apparatus for uniquely identifying an individual by

obtaining and characterizing unique physical characteristics of the individual (at least

col. 1 lines 9-15). As can be seen in figure 3 Tal discloses, multiple cameras (60, 64a,

and 64b) for obtaining images of an individual from different directions and a information

processing means 75 for comparing the information obtained from the camera (at least

col. 6 lines 51-55). Various facial feature points such as the eye retinae (15a and 15b),

the nostril openings 20, and the center of the mouth 25 are extracted (col. 4 lines 53-

69). Using the different features extracted, various parameters or patterns are formed

which are used to identify the individual (col. 5 lines 1-2, lines 60-62).

Claim 9 discloses, "An apparatus according to claim 1, comprising: image input

means for sensing an object image from different positions, and inputting a plurality of

object images at different image sensing positions; feature extraction means for

extracting feature patterns that represent features of an object from the plurality of

object images input by said image input means; verification means for verifying the

plurality of feature patterns extracted by said feature extraction means with a reference

feature pattern which is registered in advance; and discrimination means for, when at

least one of the plurality of feature patterns extracted by said feature extraction means

matches the reference feature pattern which is registered in advance as a result of

verification of said verification means, determining that an object associated with that

object image is a person himself or herself.

As discussed above Tal discloses multiple cameras, and feature extraction

means.for extracting facial patterns. Tal further discloses a means for determining if the

person seeking access is the authorized person stored in memory (verification and

registration means) (col. 3 lines 7-16). Finally Tal discloses a discrimination means

since the system forces a user to be the authorized person in order to be allowed

access to the system (at least col. 4 lines 30-35).

Claim 10 discloses, "An apparatus according to claim 9, wherein said image input

means has a plurality of image sensing means which are set in advance at a plurality of

predetermined positions, and sense an object image from a plurality of different

positions, and inputs a plurality of object images at different image sensing positions

using said plurality of image sensing means."

As discussed above Tal discloses multiple cameras which are at set at

predetermined positions to sense an object from different positions, and the images fom

the cameras are inputted into an information processing means (75 figure 3).

Claim 16 recites identical information as claim 1 except claim 16 is a method claim. Thus, an argument similar to that presented above for claim 1 is equally applicable to claim 16.

Claims 24-25 recite identical information as claims 9-10 except claims 24-25 are method claims. Thus, an argument similar to that presented above for claims 9-10 is equally applicable to claims 24-25.

3.   Claims 1,13,16, and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Flom et al. USPN 4,641,349 (hereinafter "Flom").

Claim 13 discloses, "An apparatus according to claim 1, wherein an object image is input at different image sensing positions by moving at least one image sensing means to a plurality of predetermined positions and sensing an object image at respective positions."

Flom discloses an image processing means for sensing an iris from different directions. Flom explicitly discloses, "more than one camera could be provided or a single camera could be provided which could be moved between a plurality of positions in order to obtain three-dimensional information" (col. 11 lines 13-20). Descriptors are extracted from the image in order to find a pattern specific to each individual that is compared against a reference image (verification means) for a person authorized for access to the system (col. 7 lines 44-64).

Claims 16 and 28 recite identical information as claims 1 and 13 except claims 16 and 28 are method claims. Thus, arguments similar to that presented above for claim 1 and 13 are equally applicable to claims 16 and 28.

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 2-3, 5, 7, 11, 17-18, 20, 22, and 26 are rejected under 35 U.S.C. 103(a)

as being unpatentable over Tal USPN 4,975,969 in view of Kado et al. USPN 5,995,639

(hereinafter "Kado").

Claim 3 discloses, "An apparatus according to claim 1, comprising: a plurality of

image sensing means for sensing object images from different directions; normalization

means for extracting feature points from the object images sensed by said plurality of

image sensing means, setting a feature region on the basis of the extracted feature

points, segmenting the set feature region into a plurality of regions, computing an

average value of brightness levels in each segmented region, and computing a feature

pattern on the basis of the computed average value; registration means for registering

the feature pattern computed by said normalization means as a feature pattern

associated with a predetermined object; and verification means for specifying an object

associated with the object image by comparing the feature pattern computed by said

normalization means with the feature pattern registered in said registration means."

As discussed above Tal discloses all of the limitations of claim 1. Tal further

discloses a normalization means for extracting feature points from the object (col. 8

lines 5-11) (fig. 4a-4b 130, 218). Tal uses the definable points such as the retina and

centers of gravity of the nostrils to set a feature region and measure the unique

distances between the features (col. 7 lines 30-47). Tal does not explicitly disclose

segmenting the feature region into a plurality of regions, computing an average value of

brightness levels in each region, or computing a feature pattern on the basis of the

average computed value. Tal discloses a registration means for storing the feature

pattern of a person to be identified (at least col. 2 63-68 continued to col. 3 lines 1-10),

and finally a verification means that compares the information of a person trying to

access a system with the stored information for a person with access to the system (col.

3 lines 16).

Kado discloses an apparatus for identifying persons by their face images (col. 1

line 5) that "extracts feature points of face components such as the eyes, nose, mouth,

and uses the extracted feature points to divide a face image into small patches" (col. 1

lines 60-63). Then the average brightness of each patch is found (which forms a feature

pattern) and the patches with their specific feature amounts are used to identify the face

of a person. Kado further teaches that with identifying systems where the difference

between feature points of an individual is used (such as the invention of Tal) problems

can arise such as the distance between the cameras and the individual must be fixed,

and the person must turn their face a certain way which imposes a burden on the

person.

Tal and Kado are analogous art because they are from the same field of

endeavor of identifying individuals using facial image processing.

At the time of the invention it would have been obvious to one of ordinary skill in

the art to combine Tal and Kado in order to obtain an invention that uses the average

brightness of sections of a facial image in order to identify a person. The motivation for

the combination would be to eliminate some of the problems that occur with the

invention as disclosed by Tal. Therefore it would have been obvious to one of ordinary

skill in the art to combine Tal and Kado in order to obtain the invention as disclosed in

claim 3.

The limitations of claim 2 are all included in claim 3, therefore the arguments

used for the rejection of claim 3 apply equally to claim 2.

Claim 5 discloses, "An apparatus according to claim 3, wherein said plurality of

image sensing means line up horizontally, and said normalization means computes the

feature pattern using one of a feature point group including central points of right and

left pupils and central points of right and left nasal cavities of the object image, a feature

point group including central points of right and left pupils and a central point of a left

nasal cavity of the object image, and a feature point group including central points of

right and left pupils and a central point of a right nasal cavity of the object image."

As seen in figure 3 of the disclosure by Tal the cameras 64a, 64b, and 60 line up

horizontally. Tal further discloses that the retina centers of the eyes are among the

feature points used (col. 3 line 22) and the centers of the nostril cavities (col. 4 line 57).

Claim 7 discloses, "An apparatus according to claim 3, wherein said

normalization means extracts feature vectors of different dimensions from respective

object images sensed by said plurality of image sensing means, and arranges the

extracted feature vectors of different dimensions in turn to integrate them as a

multi-dimensional feature pattern."

As discussed above Kado discloses extracting feature points from an image.

Kado further states that a 3-dimensional model is possible where "a normal vector of

each patch is extracted as well as its brightness" to express the concavo-convexity of

the face more clearly (col. 2 lines 30-41).

Claim 11 discloses, "An apparatus according to claim 9, wherein said feature

extraction means comprises: feature point detection means for detecting feature points

of an object from the input object image; feature region setting means for setting a

feature region on the basis of the feature points detected by said feature point detection

means; region segmentation means for segmenting the feature region set by said

feature region setting means into a plurality of regions; and feature pattern extraction

means for computing brightness average values in the regions segmented by said

region segmentation means, and extracting a feature pattern which represents a feature

of the object on the basis of the brightness average values."

As discussed above Tal discloses the limitations of claim 9. The further

limitations of claim 11 are similar to those of claim 3 which have already been discussed

above. Therefore similar arguments can be used to combine Tal and Kado to meet all of

the limitations of claim 11.

Claims 17-18 are similar to claims 2-3, thus the same arguments used for claims 2-3 are equally applicable to claims 17-18.

Claim 20 is similar to claim 5 thus the same argument used for claim 5 is equally applicable to claims 20.

Claim 22 is similar to claim 7 thus the same argument used for claim 7 is equally applicable to claims 22.

Claim 26 is similar to claim 11 thus the same argument used for claim 11 is equally applicable to claims 26.

6.   Claims 4, 6, 19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tal USPN 4,975,969 in view of Kado et al. USPN 5,995,639 (hereinafter "Kado") and further in view of Mann et al USPN 6,119,096 (hereinafter Mann).

Claim 4 discloses, "an apparatus according to claim 3, wherein said plurality of image sensing means line up vertically, and said normalization means computes the feature pattern using one of a feature point group including central points of right and left pupils and central points of right and left nasal cavities of the object image, and a feature point group including central points of right and left pupils of the object image."

The combination of Tal and Kado does not explicitly disclose that the plurality of image sensing means line up vertically. Tal discloses that the retina centers of the eyes (col. 3 line 22) and the centers of the nostril cavities (col. 4 line 57) are among the feature points used.

As can be seen in figure 8a Mann discloses multiple cameras that are lined up vertically. Images are taken at each camera and the best picture is selected for processing which depends on the height of the user (col. 18 lines 50-66).

Tal, Kado, and Mann are all analogous art because they are all from the same field of endeavor identifying a person using image processing.

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine Tal, Kado, and Mann in order to use the combination of Tal and Kado as discussed above, and further use cameras lined up vertically. The motivation for doing so would be to account for users of different heights and all the system to obtain the best picture possible. Therefore it would have been obvious at the time of the invention to combine Tal, Kado, and Mann in order to obtain the invention as specified in claim 4.

Claim 6 discloses, "an apparatus according to claim 3, wherein said plurality of image sensing means line up vertically and horizontally, and said normalization means computes the feature pattern using one of a feature point group including central points of right and left pupils and central points of right and left nasal cavities of the object image, a feature point group including central points of right and left pupils and a central point of a left nasal cavity of the object image, a feature point group including central points of right and left pupils and a central point of a right nasal cavity of the object image, and a feature point group including central points of right and left pupils of the object image."

Claim 6 discloses similar limitations to those discussed in claims 4 and 5. Therefore the arguments used in the rejections of claims 4 and 5 apply equally to the rejection of claim 6. Furthermore, Mann discloses it is also possible to arrange the cameras to provide an array that extends both horizontally and vertically for ease of capturing a desired image without requiring the user to be in a precise position (col. 19 lines 24-29).

Claim 19 is similar to claim 4 thus the same argument used for claim 4 is equally applicable to claim 19.

Claim 21 is similar to claim 6 thus the same arguments used for claim 6 is equally applicable to claim 21.

7.   Claim 8, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tal USPN 4,975,969 in view of Kado et al. USPN 5,995,639 (hereinafter "Kado") and further in view of Face Recognition using temporal image sequence (IEICE Transactions PRMU 97-50).

Claim 8 discloses, "an apparatus according to claim 3, wherein said normalization means captures object images sensed by said plurality of image sensing means at predetermined time intervals, computes feature patterns of the object images of identical times, and arranges feature patterns of different times in turn to integrate them as a time-series feature pattern."

As discussed above the combination of Tal and Kado disclose all of the limitations of claim 3. The combination of Tal and Kado does not explicitly disclose capturing the object images at predetermined time intervals, and arranging feature

patterns of different times to integrate them as a time-series feature pattern. *Face Recognition using temporal image sequence* discloses capturing multiple image over a time interval and forming a subspace pattern in order to reflect different facial expressions and directions (as disclosed at least in the abstract).

Tal, Kado, and *Face recognition using temporal image sequence* are all analogous art because they are all from the same field of endeavor of identifying a person using image processing.

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine Tal, Kado, and the teachings of *Face recognition using temporal image sequence* in order to obtain an identification system that accounts for the different facial expressions of a person. The motivation for doing so would be to account for the physical changes in a persons face depending on their mood or position. Therefore it would have been obvious at the time of the invention to one of ordinary skill in the art to combine Tal, Kado, and the teachings of *Face recognition using temporal image sequence* to obtain the invention as specified in claim 8.

Claim 23 is similar to claim 8 thus the same argument used for claim 8 is equally applicable to claim 23.

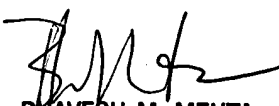### *Allowable Subject Matter*

8.   Claims 12, 14-15, 27, and 29-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Contact Information

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to John B Strege whose telephone number is (703) 305-

8679. The examiner can normally be reached Monday-Friday between the hours of 9-

5..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Bhavesh Mehta can be reached on (703) 308-5246. The fax phone number

for the organization where this application or proceeding is assigned is 703-872-9306.

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